

SARDINE FISHERIES: RESOURCE ASSESSMENT AND SOCIAL AND ECONOMIC SITUATION

Structure of the Presentation

- 1. General Information**
- 2. Social and Economic Dimensions of Fisheries**
- 3. Status of the Sardine Stocks**
- 4. Management of Sardine Fisheries**
- 5. Conclusions**
- 6. Recommendations**

1. General Information

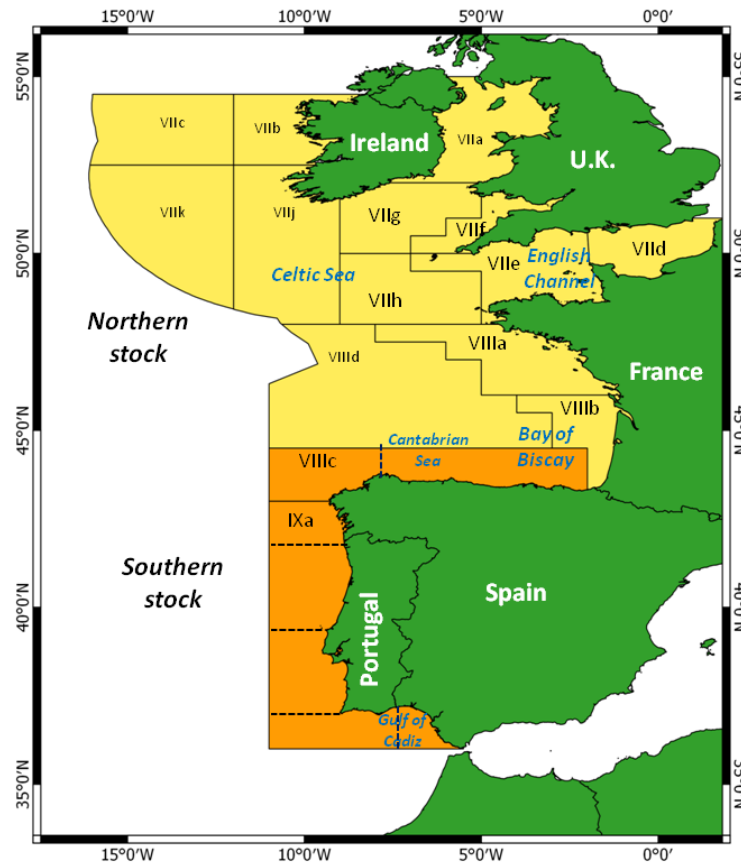
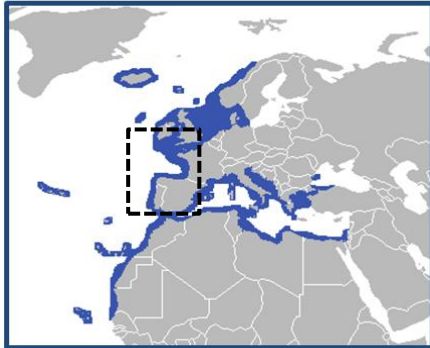
Distribution and stock structure

- Northeast Atlantic Ocean and Mediterranean Sea
- Two stocks in European Atlantic waters

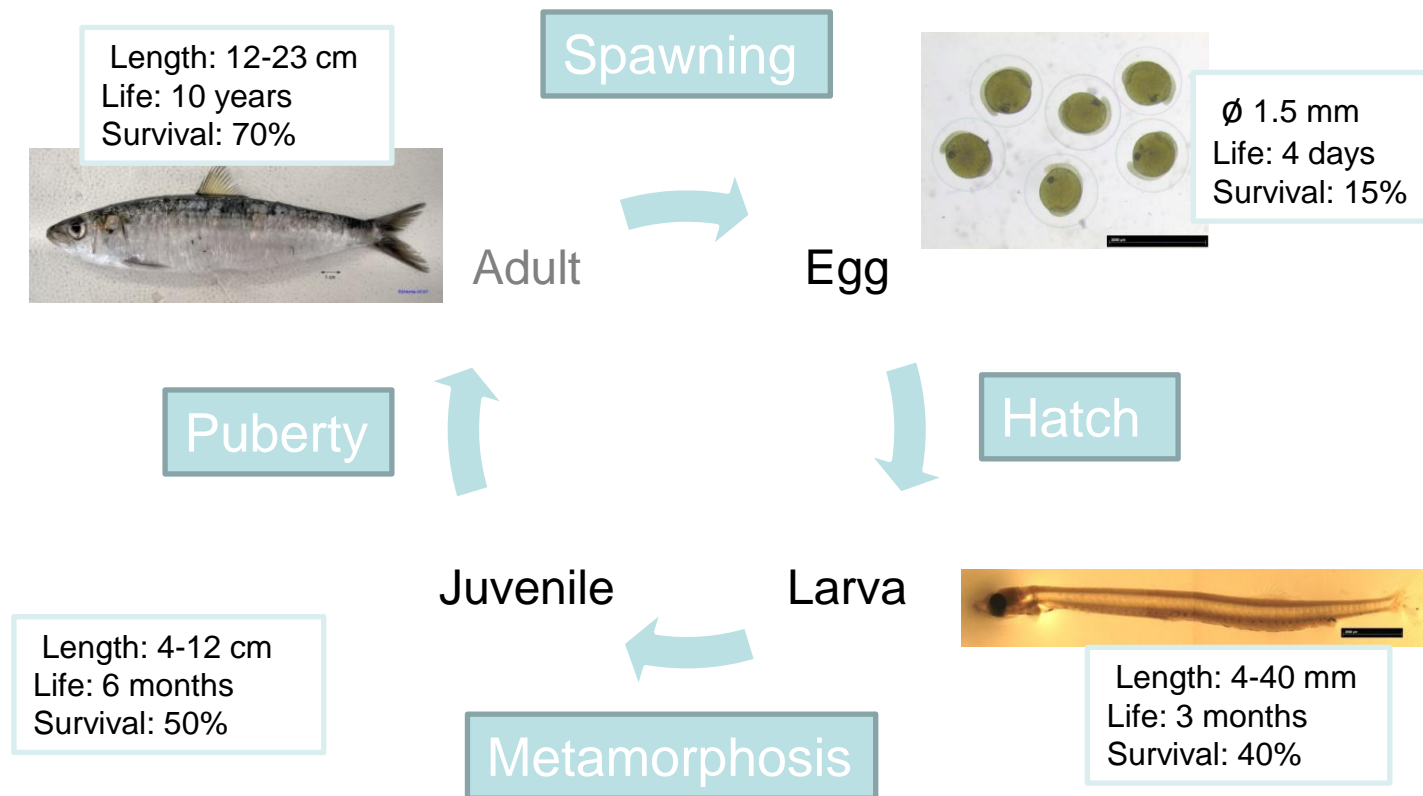
Biology and Ecology

- Pelagic, schooling species, feed on plankton
- Grows to a length of 23 cm and lives 10-12 years
- High fecundity, high natural mortality (eggs and larvae)
- Survival of eggs and larvae highly dependent on environmental conditions
- Abundance of young individuals recruiting each year critical for stock health
- Fishing amplifies variations recruitment

1. General Information



1. General Information



2. Social and Economic Dimensions

Northern stock (Sub-areas VII and VIIIa,b,d)

- Fished mainly by France, Spain and UK
- In 2014, landings were 45 000 tonnes; landings have doubled since 1990
- Data from Subarea VII is scarce

- Subarea VIII:

French data include 1000 t sardine fished in Subarea VII

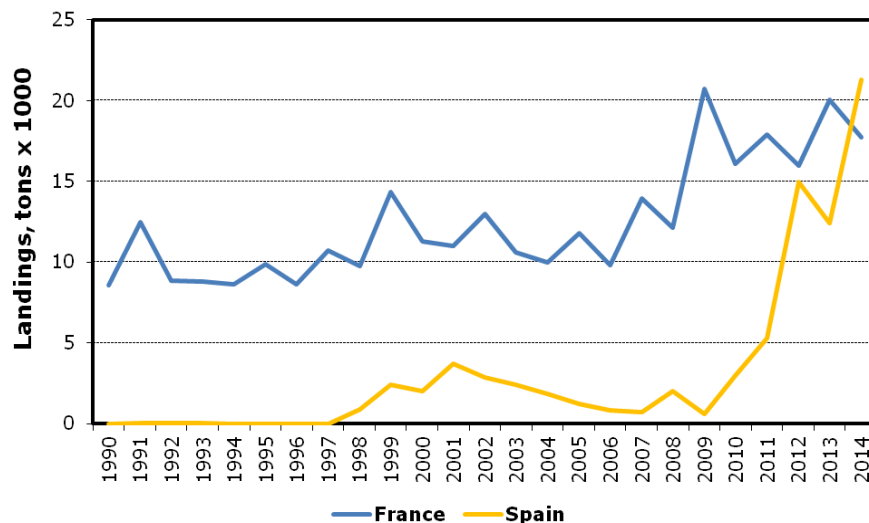
Spanish fishery in Subarea VIIIb is seasonal

	France	Spain	Total
Landings, tonnes	18 900	21 300	40 200
Landings, MEUR	14	27	41
Number of vessels	49	100	149
Number of fishing days	2 300	1 860	4 160
Vessel LOA(m) / Power (kW)	18/n.a.	17/138	17-18
Number of fishers	200	1000	1 200

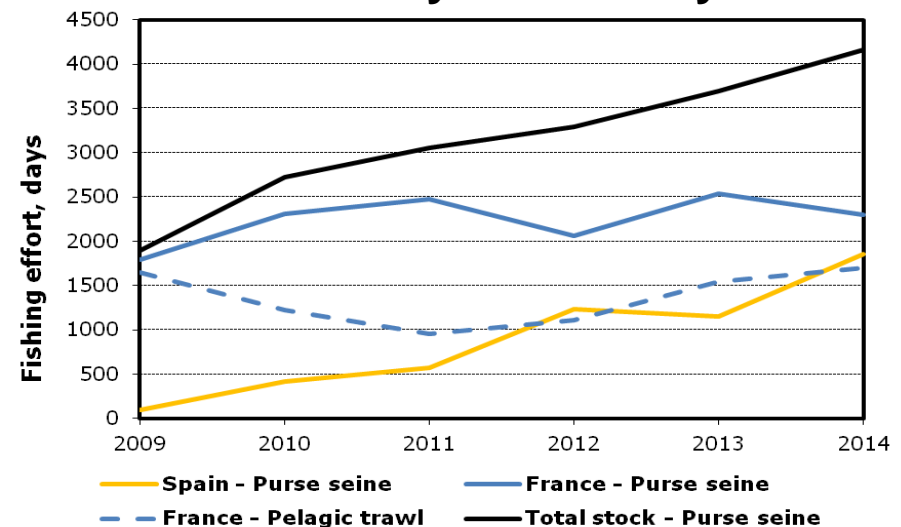
2. Social and Economic Dimensions

Northern stock: effort and landings in ICES Subarea VIII

Sardine landings by country



Number of fishing days by country and fishery



- Increased effort and landings in area VIII due to decrease of fishing opportunities for the Southern stock and high abundance of sardine in the area

2. Social and Economic Dimensions

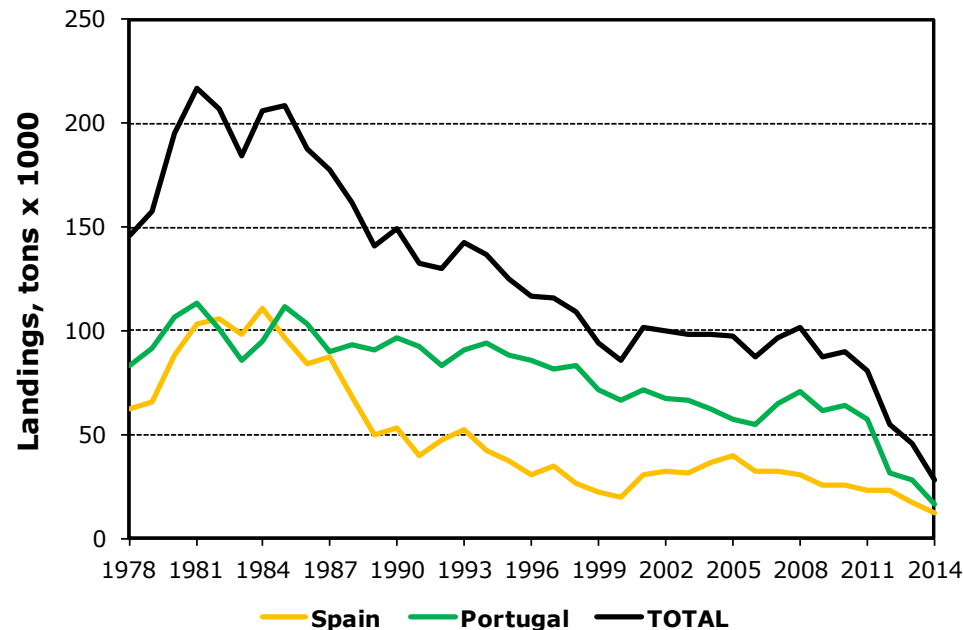
Southern stock (Subarea VIIc and Division IXa)

- Fished by purse seine fleets of Spain and Portugal
- In 2014:

	Spain	Portugal	Total
Landings, tonnes	11 900	16 000	27 900
Landings, MEUR	15	32	47
Number of vessels	364	182	546
Number of fishing days ⁽³⁾	9 000	11 000	20 000
Vessel LOA(m) / Power (kW)	17/138	18-24/215	-
Number of fishers	3 700	2 000	5 700

2. Social and Economic Dimensions

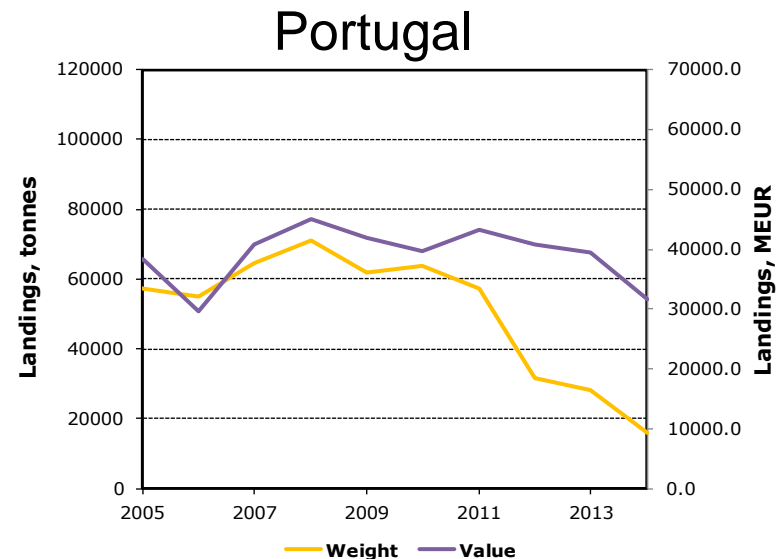
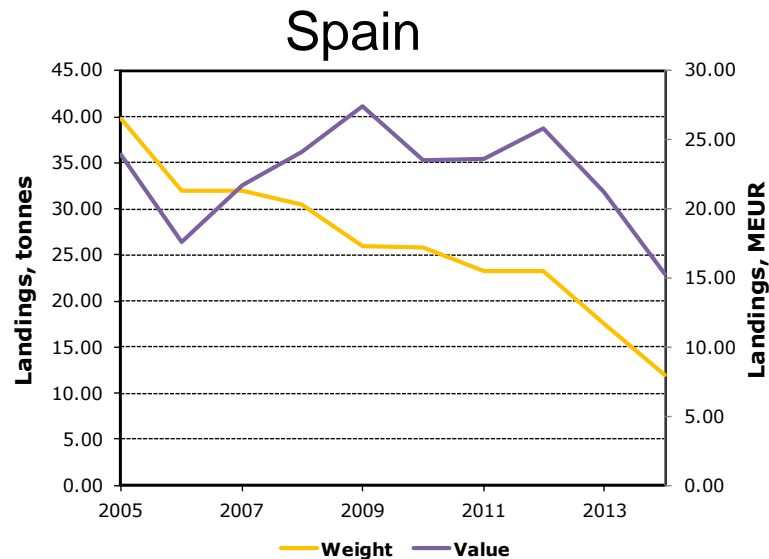
Southern stock: landings in weight



- Landings have decreased since 1981
- From 2011 to 2014 landings decreased sharply (65%) due to stock decline and catch regulations

2. Social and Economic Dimensions

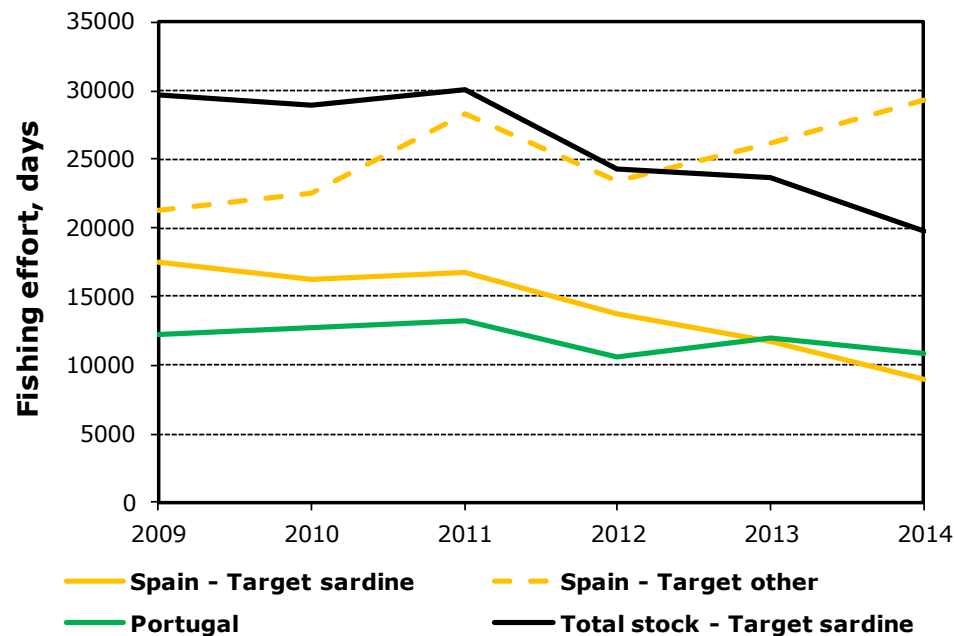
Southern stock: landings in value (first sale)



- The increase in the price of first sale compensated the drop in the volume of landings

2. Social and Economic Dimensions

Southern stock: fishing effort

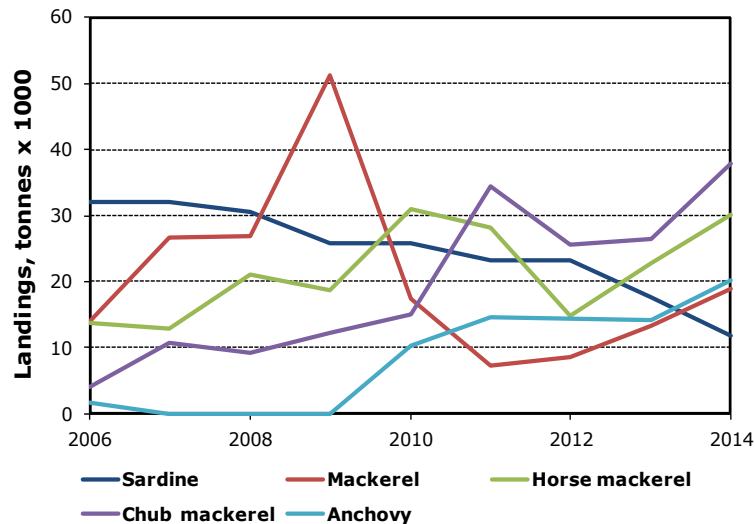


- Purse seine effort transferred to other pelagic species
- In Spain: anchovy, chub mackerel and mackerel
- In Portugal: chub mackerel and (less) horse mackerel

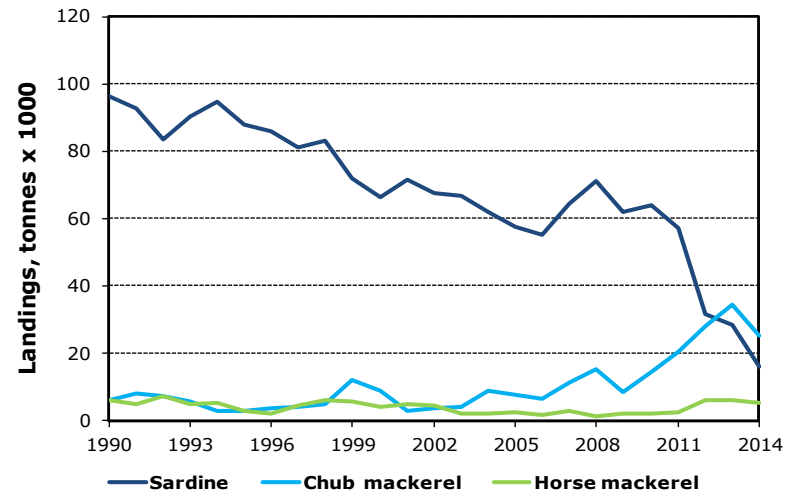
2. Social and Economic Dimensions

Southern stock: landings of other species by the purse seine fleet

Spain



Portugal



2. Social and Economic Dimensions

Southern stock: canning industry

	Spain ⁽¹⁾	Portugal
Number of factories	65	20
Canned sardine, tonnes	>22 041	13 300 ⁽²⁾
Canned sardine, MEUR	n.a.	54.5 ⁽²⁾
Exports canned sardine, tonnes	6 271	12 000
Exports canned sardine, MEUR	27.7	58.9
Countries for exports	Italy, France, Portugal, UK, Germany	France, Italy, UK, Angola, USA, Canada, Japan, Israel
Imports canned sardine, tonnes	15 358	9 700
Imports canned sardine, MEUR	46.1	15
Number people employed in canning industry	12 000	3500
% women employed in the canning industry	>95	90-95

⁽¹⁾ Values for Galicia, accumulated for 2012-2014; Galicia produces 80% of Spanish canned fish

⁽²⁾ Data for 2013

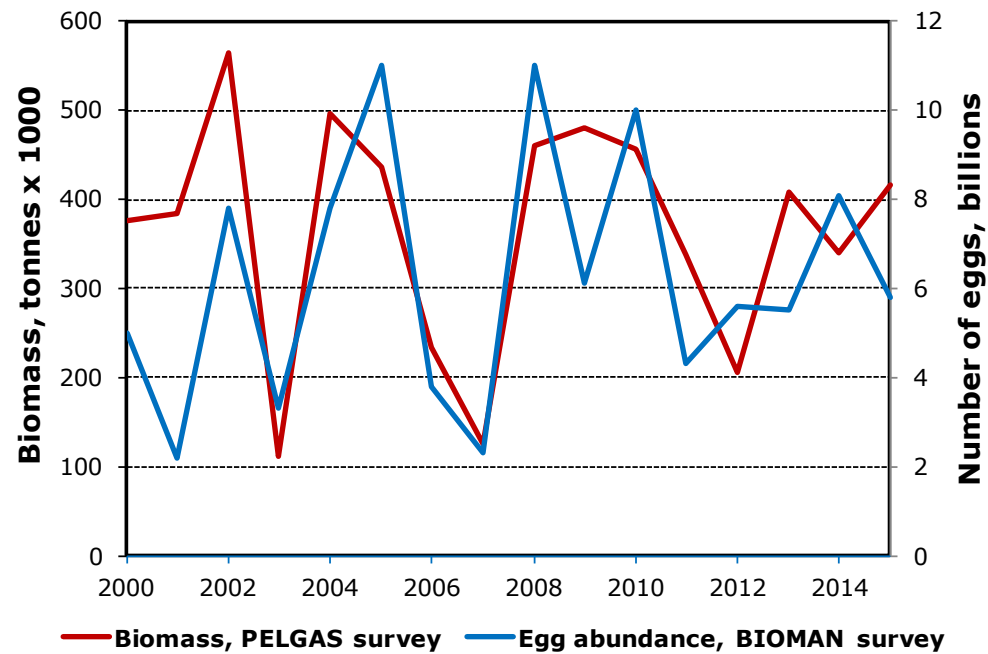
3. Status of the Sardine Stocks

Northern stock (Sub-areas VII and VIIIa,b,d)

- No assessment of the whole stock due to insufficient data for Subarea VII
- Trend-based assessment performed in Subarea VIII (Bay of Biscay)
- Assessment indicates an increasing trend of biomass over the last five years
- Frequent episodes of good recruitment in recent years
- Current level of exploitation likely to be sustainable

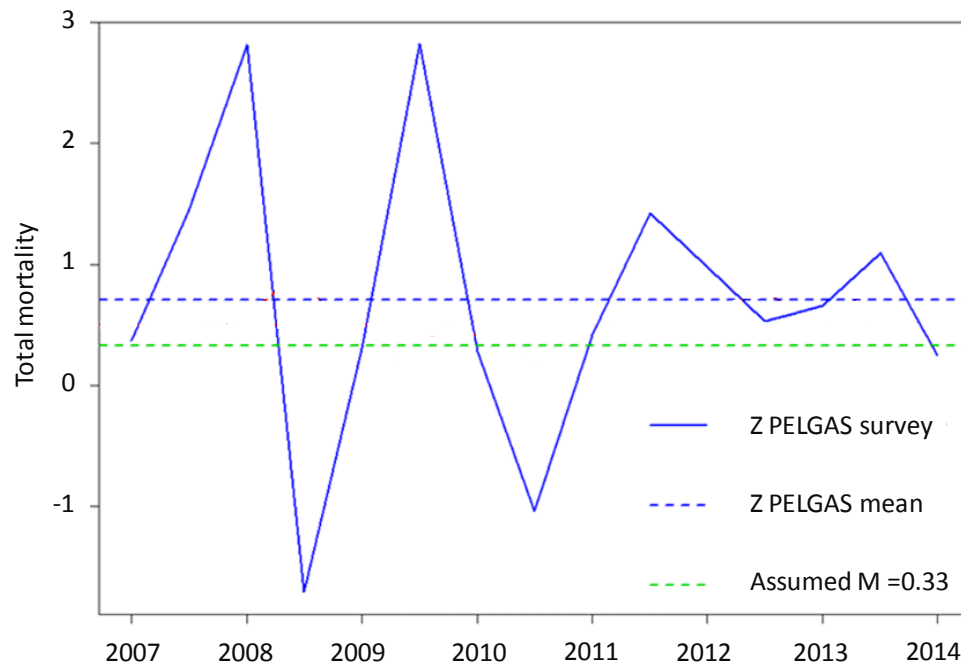
3. Status of the Sardine Stocks

Northern stock: indices of sardine abundance in Sub-area VIII



3. Status of the Sardine Stocks

Northern stock: index of sardine total mortality in Sub-area VIII



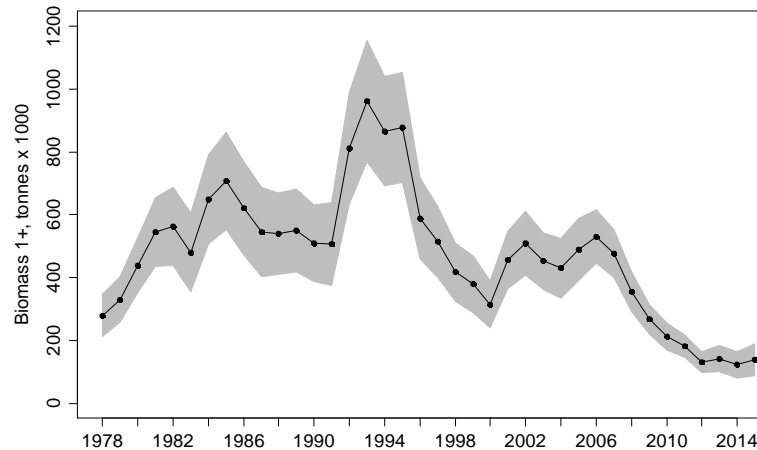
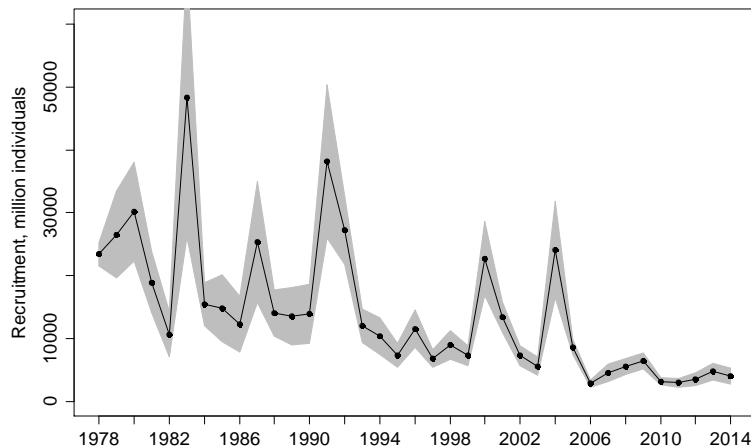
3. Status of the Sardine Stocks

Southern stock (Sub-area VIIc and Division IXa)

- Assessed with a statistical catch-at-age model using fisheries and survey data covering the whole stock area

3. Status of the Sardine Stocks

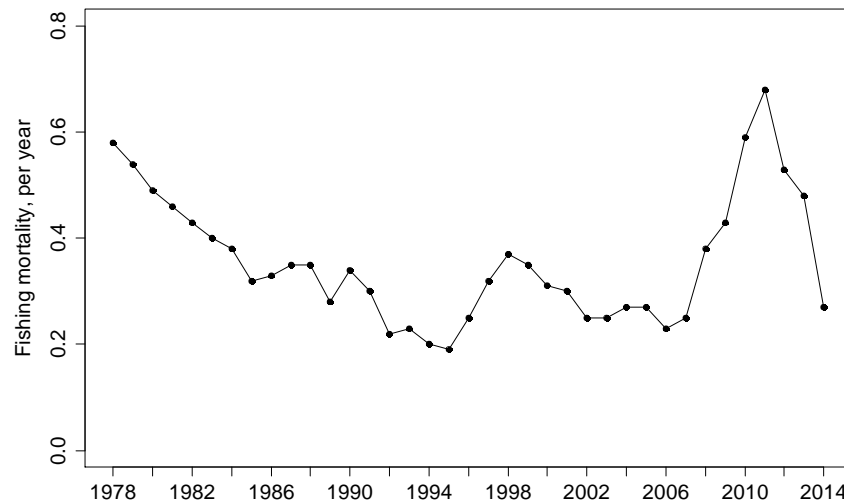
Southern stock Recruitment Biomass



- Very low recruitment and 71% biomass decrease since 2006
- Current biomass around the lowest historical level
- Reproductive capacity might be at risk

3. Status of the Sardine Stocks

Southern stock: Fishing mortality



- Fishing mortality has been high in some recent years
- Implementation of low catch limits contributed to a decrease of 65% in fishing mortality from 2011 to 2014

4. Management of Sardine Fisheries

- None of the stocks is managed by EU TAC
- Northern stock:
 - technical measures and limits to purse seine licensing in French waters
- Southern stock:
 - technical measures, limits to purse seine licensing, limits to fishing effort and catches
 - Management Plan, consisting of a catch based Harvest Control Rule (implemented by Spain and Portugal since 2014)

5. Conclusions

- Sardine has significant social and economic importance for fishing and canning industries in Portugal, Spain and France
- **Northern stock:**
 - In Subarea VIII, sardine biomass increased over the last five years due to good recruitments and a sustainable harvest rate
 - Catches increased notably in recent years due to abundance of sardine in the area and low fishing opportunities for the Southern stock
 - Technical measures are in place to manage the stock but effort and catches are not regulated.
 - Catches advised by ICES for each of the years 2016 and 2017, no more than 33 065 tonnes, follow the precautionary approach.

5. Conclusions

- **Southern stock:**
 - Shows a downward trend since 2006 due to poor recruitment and high fishing mortality in some recent years
 - Biomass in 2015, 139 000 tonnes, is at the lowest historical level
 - Reductions in effort and catches contributed to reduce fishing mortality by 65% since 2011
 - The decline of the stock appears to have been arrested, however, recruitment continued to be low
 - Spain and Portugal implemented a Management Plan for sardine; there is no formal agreement on how to divide the catch limit among countries
 - Catches advised by ICES for 2016, no more than 1 587 tonnes, follow the management plan

6. Recommendations

- Northern stock:
 - Develop a Management Plan for the Northern stock
 - Promote the collection of data from ICES Subarea VII
- Southern stock:
 - Evaluate additional technical measures to protect juveniles and spawners
 - Review the harvest rule of the Management Plan
 - Work towards an agreement to divide catches among Spain and Portugal
- Both stocks
 - Multidisciplinary studies on the causes of stock fluctuations
 - improve knowledge on the connectivity among stocks
 - Promote reporting of social and economic data for the fisheries
 - Improve fishing practices to decrease slipping

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**Thank you very much for your
attention**